

OBSERVATIONS
ON
LITHOTOMY;
BEING A REPUBLICATION OF
DR. JAMES DOUGLAS' APPENDIX
TO HIS HISTORY OF THE
LATERAL OPERATION FOR THE STONE,
AND OF
THE OTHER ORIGINAL PAPERS
RELATIVE TO
MR. CHESELDEN'S
INVENTION AND IMPROVEMENT OF THAT OPERATION.
TO WHICH IS ADDED,
A PROPOSAL FOR A
NEW MANNER OF CUTTING FOR THE STONE,
BY JOHN THOMSON, M. D.
ONE OF THE SURGEONS OF THE ROYAL INFIRMARY, PROFESSOR OF SURGERY TO
THE ROYAL COLLEGE OF SURGEONS, AND REGIUS PROFESSOR OF
MILITARY SURGERY IN THE UNIVERSITY OF EDINBURGH.

EDINBURGH:

PRINTED FOR WILLIAM BLACKWOOD, 64 SOUTH BRIDGE-STREET; AND
LONGMAN, HURST, REES, AND ORME, PATERNOSTER-RROW,
LONDON.
1808.

1861-1862

11

YACHTING

YACHTING IN THE BAY OF FUNDY

BY J. H. B. B. B.

NEW YORK: PUBLISHED BY J. H. B. B. B.

NEW YORK: PUBLISHED BY J. H. B. B. B.

NEW YORK: PUBLISHED BY J. H. B. B. B.

NEW YORK: PUBLISHED BY J. H. B. B. B.

NEW YORK: PUBLISHED BY J. H. B. B. B.

NEW YORK: PUBLISHED BY J. H. B. B. B.

NEW YORK: PUBLISHED BY J. H. B. B. B.

NEW YORK: PUBLISHED BY J. H. B. B. B.

R54886

TO THE

STUDENTS OF SURGERY,

IN EDINBURGH.

GENTLEMEN,

I HAVE been induced to become the Editor of Dr. James Douglas' account of Mr. Cheselden's improved Method of Operating for the Stone, from a belief that Mr. Cheselden's operation, at one time so justly regarded as the pride of English surgery, is now but very imperfectly known. I have met with but few surgeons who had ever seen the original description of this operation ; and of those who have attempted to give an account of it in their writings, some describe an operation which Mr. Cheselden had himself abandoned, while

others, in their account of his improved method, omit circumstances, a minute attention to which in the performance of the operation, that great surgeon considered as essentially necessary to ensure its success.

What the reasons were which induced English surgeons to relinquish, in their operations, Mr. Cheselden's manner of dividing the neck of the bladder and prostate gland, it may not now be easy to ascertain; but a fair and accurate comparison of his manner with the supposed improvements which have since been suggested, cannot fail, I think, to convince every impartial inquirer that Mr. Cheselden's operation still remains unrivalled in the simplicity of the invention, and in the facility and security with which it may be performed.

It may seem strange, therefore, that to this republication of Dr. Douglas' account I should venture to add a proposal for a new manner of cutting for the stone. This manner I do not venture to propose as an improvement on Mr. Cheselden's operation, though I am inclined to hope that it will be found, on trial, less liable to objections than that performed

with any of the cutting gorgets now in use. I am aware, however, that the manner of operating which I have proposed may, in some respects, appear to be a variation on a method first described by M. Le Dran, in the year 1742. That you may, at one glance, see the points in which it agrees with, and in which it differs from that of M. Le Dran, I have given M. Le Dran's account of his operation in his own words. The past history of our art, and particularly that branch of it which relates to Lithotomy, shows but too clearly, that this is the only way in which dead authors, at least, are likely to have their opinions correctly and fairly stated. Among the various methods of cutting for the stone which have been suggested by those who, since the time of Mr. Cheselden, have laboured unavailingly to improve upon his operation, that of M. Le Dran appears to me to be indeed the simplest and safest in its execution ; yet M. Le Dran's method has met with but little, if any attention, from those, M. Deschamp excepted, who have described or practised the operation for the stone. My proposal will probably meet with a simi-

lar fate; but I shall regret this the less, if the present publication shall tend, in any degree, to recal the attention of English surgeons to Mr. Cheselden's improved method of operating, or convey to you accurate information respecting it.

To enable you to perceive readily the different steps by which Mr. Cheselden was led to adopt this method, and to render the history of it as complete as possible, I have judged it necessary to prefix to Dr. Douglas' Appendix, his "Postscript to the History of the Lateral Operation," and to subjoin to that Appendix the last edition of the "Short Historical Account of Cutting for the Stone," which Mr. Cheselden first added to the fourth edition of his *Anatomy of the Human Body*, printed at London in the year 1730; these being, besides the Appendix, the only other original documents which I have met with in our language, relative to the share which Mr. Cheselden had in improving the lateral operation.

Such of you, Gentlemen, as may be desirous to obtain a more minute knowledge of the parts concerned in this operation, than is contained

in Dr. Douglas' Appendix, will find ample information in the delineations and description of these parts given in the second book of Camper's *Demonstrationes Anatomico-pathologicæ*. That great anatomist and skilful draughtsman, has had the merit of introducing into this particular branch of anatomy, a degree of accuracy and precision, of which the subject seemed to be scarcely susceptible. His views may be copied or imitated, but I despair of ever seeing them excelled.

I am,

GENTLEMEN,

with sincere regard,

Your most obedient and devoted servant,

JOHN THOMSON.

*Brown's Square,
15th March, 1808.*

CONTENTS.

	Page
Dr. Douglas' Postscript to his History of the Lateral Operation for the Stone, containing an Account of Mr. Cheselden's first Manner of performing that Operation.....	I
Mr. Cheselden's Account of his second Manner.....	14
Dr. Douglas' Appendix, containing an Account of Mr. Chesel- den's third Manner	15
Mr. Cheselden's own Account of his third Manner.....	59
M. Le Dran's Method	71
Proposal by the Editor.....	81
Explanation of Plate	89

DR. DOUGLAS' POSTSCRIPT

TO HIS

HISTORY OF THE LATERAL OPERATION

FOR THE STONE.

Containing an Account of the Introduction and Improvement of
this Method in London.



LONDON:

PRINTED IN THE YEAR 1726.

Mr. Cheselden, in the Appendix, p. 342, to the fourth edition of his Anatomy, printed at London in 1730, alluding to the account contained in this Postscript, expresses himself in the following terms: “ I forbear to give a more particular account of the “ manner of performing this operation, it having been done already “ as well as is possible by Doctor Douglas.”...EDITOR.

POSTSCRIPT.

IN the begining of the foregoing chapter, I observed, that though several accounts of Professor Rau's operation for the stone have been published, and many more handed about by those who pretend to have seen him cut, yet they are all both imperfect and full of mistakes; and that it is entirely owing to the learned and accurate Dr. Albinus, that this great man's method was not for ever lost to posterity.

As soon as the Doctor's book was published at Leyden, he did me the honour, amongst several of his ingenious friends here in London, to send it me in a present; and at the next meeting of the Royal Society, I thought proper to lay before them an abstract, in English, of that part of it which relates to Mr. Rau's operation for the stone; together with several preparations, from which I demonstrated and described the parts concerned in it.

These preparations I have had now a good many years by me: They make part of a complete collection that I have made, by which all the possible ways of getting in to the human bladder, in order to extract a stone, may with the greatest clearness be illustrated; and the advantages and inconve-

niencies of each of them, as far as these depend on the structure of the parts, with the greatest certainty determined.

Of these ways, I always reckoned that practised by Professor Rau to be one, long before I had heard any thing of his true method, or even of that of Frere Jacques, from which it is taken; and, indeed, my preparations will serve to direct in every step of his operation, and point out the parts that are either to be cut or avoided in it, as fully as if I had had Albinus' book before me when I went about them. And I will venture to say, that the examination of such preparations as these, when fresh subjects cannot be had, which every surgeon and anatomist must know is too often the case with us, is the surest and easiest way to enable us to understand, and make the right use of what has been written upon the subject of Lithotomy, which of late years has made so much noise in our physical world.

But to return from this short digression:—If I may judge by the event, what I then offered to the Royal Society was by many members of that honourable body thought no unsuitable entertainment for them; for from that time several worthy physicians and surgeons, having carefully read Albinus' book, and examined my preparations, began to think seriously of introducing the practice of it among us. And I most willingly embrace this opportunity of doing justice to the ingenious Dr. Bamber and Mr. Cheselden, by declaring in a public manner, (what I had many opportunities of

knowing, having assisted at most of the experiments they made on dead bodies) that as it was their turn to cut in the two great hospitals of this city the following season, I beheld with the utmost pleasure, the alacrity, industry, and application, with which they soon made themselves masters, each in the way that suited his genius best, of the true method of performing an operation, which they thought they had all the reasons that theory could furnish, to prefer even to the high way of cutting, which both of them had for a considerable time practised with great success.

On the seventh day of last August, Dr. Bamber made the first trial of it on living bodies in St. Bartholomew's Hospital, and since that time he has made several more. In all these operations he has thought it proper to follow every step of Mr. Rau's method, except that he filled the bladder moderately with water; and therefore, as his dexterity and skill in every operation he goes about are sufficiently known, there remains no more to be said about them; save only, that as far as can be judged from the number he has cut, his success is hitherto at least equal to that of Mr. Rau.

Mr. Cheselden began to cut in St. Thomas' Hospital a few days after Dr. Bamber; but as he has thought fit to vary Professor Rau's method considerably, I must beg leave to insist a little more on his operation.

I have already mentioned an account of Rau's method given by Mr. Cheselden, in the Preface to his Treatise on the High Operation for the Stone,

published 1723, as he had received it from those who had been scholars to Mr. Rau, and several times present at his operations. His informations were indeed very lame and imperfect; but yet, even from these, he had conceived so favourable an idea of that method, as to think it preferable either to that of Celsus or Marianus; and withal, that it would be still more so, “if the bladder was first filled with water.”

Albinus’ late treatise has, as I have already remarked, given this ingenious and most expert surgeon an opportunity of examining the whole matter with more clearness and certainty than he had done before; and the fruit of the pains he has been at, is not only to confirm him in his former favourable opinion of it, but also to bring it to such a degree of perfection, as in his judgment makes it preferable to all the methods of cutting that have ever been invented.

Now, as Mr. Cheselden’s method must be reckoned an improvement of that first attempted by Frere Jacques, a description of it, such as a spectator is able to give, does even upon that account very well deserve a place in the history I have ventured to write of the “Lateral Operation for the Stone:” And if, in what I shall say about it, I shall happen to mistake or omit any material circumstance, I wish that may serve as an inducement to the happy improver to rectify and complete whatever is amiss or wanting in mine, by obliging the public himself with a more accurate and full account of his own operation.

The table upon which the patient is placed is highest at that end upon which his buttocks rest; and by means of a pillow laid under him there, and another under his head when he lies upon his back, his belly is lower than any other part of his body.

His buttocks are placed upon the edge of the table, and his knees being separated from one another, and bent as much as they can be conveniently, his wrists and ankles are tied together; and he is kept in that situation by three assistants, one at each leg, and a third at his head; who presses with his two hands upon the patient's shoulders, to keep him from retiring backward from the operator.

The patient being brought from his bed in a night-gown, and situated in this manner, the operator thrusts an hollow grooved steel catheter, through the *urethra* into the bladder; and with a syringe mounted with an ox's *ureter*, injects as much warm water into it as the patient can bear without pain, in the same manner as is done in the high operation. Into one patient of about eighteen years of age, and who had a stone weighing six ounces and a quarter, Mr. Cheselden injected seven ounces of water; but he thinks the quantity may always be determined by the complaints of the patient, without observing any other rule.

When the water is injected, and secured from running out, by tying round the *penis* a narrow slip of flannel, he gives the end of the catheter to an intelligent assistant to hold; whose principal care is to keep it from rising, but not at all to direct

the groove to the place where the incision is to be made, for a reason that we shall hear presently.

Then the operator having seated himself upon a chair, the height of which is suitable to that of the table on which the patient is laid, takes a pointed knife with a convex edge, and beginning about an inch above the *anus*, on the left side of the *raphe*, between the *accelerator urinae*, or as I name that muscle, *constrictor urethrae*, and the *erector penis*, he makes an incision downwards by the side of the *sphincter ani*, a little obliquely outwards as it descends from two and an half to four inches in length, according to the age of the patient, or size and structure of the parts. This first incision he endeavours to make all at one stroke, so as to cut through the skin, fat and all, or part of the *levator ani*, which lies in his way.

As soon as this is done, he thrusts the forefinger of his left hand into the middle of the wound, in order to press the *intestinum rectum* to one side, that it may be in less danger of being cut; and taking a crooked knife in his other hand, with the edge on the concave side, he thrusts the point of it through the wound close by his finger into the bladder, between the *vesicula seminalis* and *os ischium* of the same side; then lowering his hand, he continues this second incision upwards, till the point of his knife comes out at the upper part of the first.

This incision being finished, he thrusts the forefinger of his left hand through the wound into the cavity of the bladder; and having felt and secured

the stone, he introduces his forceps upon his finger, and endeavours to lay fast hold of the stone with it; then he pulls out his finger, and taking the forceps in both hands, he extracts the stone with greater or less facility, according to the size thereof, or largeness of the wound he has made.

If there are more stones than one, he feels for the rest with his finger, then introduces his forceps, and extracts them in the same manner.

During the whole operation, the catheter remains in the bladder; and all that the assistant who holds it has to mind is, as has been already said, to keep it from rising. By this means Mr. Cheselden thinks the bladder is pressed down sufficiently to facilitate the entry of the forceps upon his finger without the use of any director; and it being filled with water, there is no occasion to cut upon a groove; neither is there any danger of laying hold of the catheter with the forceps, if due care is taken to manage that rightly after it is in the bladder.

In this method of operating there are but one or two arterial branches cut, from which there is any danger of an haemorrhage, and not always from them neither: However, if after the wound is well cleansed and washed with a wetted sponge, any quantity of blood continues to run, he ties the vessels immediately; and then having applied pledgets of dry lint and other proper dressings, the patient is afterwards carried to bed.

This is Mr. Cheselden's regular method of cutting; and when no accident happens, which it was

impossible to be aware of before the operation, he has been seldom above a minute (sometimes less) between the beginning of the first incision and extraction of the stone.

There are circumstances, however, in which he finds it necessary to vary some steps of his method. These, as far as I have been witness to, or can remember them, are as follows :

First, when having laid hold of the stone with the forceps, he finds by the force it takes to draw it out, or other signs, that it is very large, rather than expose the patient to the danger and pain of a violent dilaceration of the parts, he chuses either with a pair of seissars, if it is the upper part, or his knife if the lower, to enlarge the wound by an additional incision.

Secondly, If after the second incision is made, he finds by the finger which he endeavours to thrust into the bladder, that the catheter has slipped into the wound, which, by the straining of the patient and other accidents, sometimes happens; then he withdraws his finger, and instead thereof thrusts a gorgeret into the groove of the catheter, upon which he introduces his forceps in the ordinary manner. It is only with a view to this accident, that he prefers a grooved catheter to one entirely round, such as was used by Frere Jacques.

Thirdly, When the assistant, who holds the catheter, gives him any ground to think that he has laid hold of that with the forceps instead of the stone; which, though he believes it will rarely happen, yet is not impossible; he orders it immediately to be

pulled out, and then endeavours to lay hold of and extract the stone without that conveniency which the pressing down of the bladder would afford him, if he should be obliged to introduce his forceps oftener than once.

Fourthly, When by the smallness or situation of the stone, he finds this method to be easier or more safe, he thrusts his fingers into the *anus*; and having pressed the stone towards the orifice of the wound, he pulls it out with his other hand, without using any forceps at all.

Lastly, When he feels, either by his finger, or the resistance the stone makes to the force with which he strives to draw it out, that there is any kind of constriction, either of the ureters or membranes of the bladder about it, he endeavours by thrusting his fingers into the *anus*, or other proper methods, to bring that part near the orifice of the wound; and then with his knife he cuts these membranes which had formed the *sphincter*; and thus the stone being disengaged is extracted with the greatest ease.

As I have here described Mr. Cheselden's new operation nearly in the same order that Albinus has followed in that of Mr. Rau, it will be easy for the reader to perceive what additions or alterations are owing to him, or, in one word, what improvements he has made; so that it would be altogether superfluous to lengthen this Postscript any farther, by comparing them together.

Mr. Cheselden has hitherto cut but seven patients this way that I know of; and whoever has

heard of the wonderful success which attended his practice of the high operation, will have but little room to doubt of the happy event of his present method, in which even these first trials have succeeded equally, if not beyond whatever he could boast of in the former.

To conclude: Were I not afraid of being thought to pass the bounds I prescribed to myself in this history, of only relating and comparing facts together, without interposing my own judgment, I might add, that in my opinion there is nothing wanting in Mr. Cheselden's method of performing the lateral operation, by which it can in any respect be improved, except the use of crooked forceps upon some occasions; for I have frequently observed at both hospitals, that the stone is much more easily extracted, when it lies on that side of the bladder in which the incision is made, than when it lies on the other, especially if the cavity to be observed there, is of a preternatural depth or breadth, as it sometimes happens. Therefore when this is the case, I am of opinion that if the forceps were a little crooked, the stone might with less difficulty be laid hold of, than by the straight ones which have been hitherto used. It is true, that crooked forceps will be weaker than the others; but the difference in strength would be more than compensated by the facility of charging the stone; because in this, rather than in the force necessary to extract it when laid hold of, the inconvenience I am talking about seems to consist.

* * The manner of cutting, described in the preceding Postscript, not having been found, on trial, so successful as had been expected, was soon given up, and a new manner adopted in its stead, of which Mr. Cheselden himself gave a very brief description in the Appendix to the fourth edition of his *Anatomy of the Human Body*, printed at London in the year 1730. But this second manner of cutting, though it had been found in practice to be much more successful than the first, seems likewise to have been very soon abandoned; for Dr. Douglas, in 1731, published the Appendix to his *History of the Lateral Operation*, containing an account of a third manner, which he denominates Mr. Cheselden's improved Method of cutting for the Stone. It deserves to be remarked, that it was Mr. Cheselden's second manner of cutting that has been described in the *OPUSCULES DE CHIRURGIE* of M. Morand, who was deputed, and his expences defrayed, by the Royal Academy of Sciences in Paris, to come over to England, and learn from Mr. Cheselden himself, his way of operating for the stone; and accordingly we find, that most French authors, taking their account from M. Morand, describe Mr. Cheselden's second, not his third operation, as that which he invented, and which bears his name. But that Mr. Cheselden never resumed his second manner of cutting, may be presumed from his continuing to describe the third only in all the editions of his *Anatomy* published subsequent to that of 1730. EDITOR.

EXTRACT
FROM
THE APPENDIX TO THE FOURTH EDITION
OF
MR. CHESELDEN'S
ANATOMY OF THE HUMAN BODY,

PRINTED AT LONDON IN THE YEAR 1730,

Containing his own Account of his second Manner of cutting for the Stone.

THIS operation I do in the following manner. I tie the patient, as for the greater Apparatus, but lay him upon a blanket several doubles upon an horizontal table three foot high, or a little more, with his head only raised. I first make as long an incision as I well can, beginning near the place where the old operation ends, and cutting down between the *musculus accelerator urinæ*, and *erector penis*, and by the side of the *intestinum rectum*: I then feel for the staff, and cut upon it the length of the prostate gland straight on to the bladder, holding down the gut all the while with one or two fingers of my left hand. The rest of this operation is the same as in the old way: But in this way there being often cut small vessels, I always tie them with a ligature, passed under them by the help of a crooked needle.

AN
APPENDIX
TO THE
HISTORY OF THE LATERAL OPERATION
FOR THE STONE,

CONTAINING
MR. CHESELDEN'S PRESENT METHOD OF PERFORMING IT.

BY DR. JAMES DOUGLAS.

LONDON:

PRINTED IN THE YEAR 1731.

PREFACE.

As some may be apt to find fault with the tedious prolixity of the following description, and with the needless repetition of a great many particulars, which being common to Mr. Cheselden's operation with all the other methods of extracting a stone out of the bladder, are consequently to be found in almost every book of Lithotomy; I think it necessary to acquaint my reader, that this very long account was unavoidable in the plan I laid down when I first undertook this description. The great and uncommon success of Mr. Cheselden's new method, became not only the subject of all conversation here at home, but also very much alarmed the surgeons abroad, particularly those of Paris, from whence M. Morand, of the Royal Academy of Sciences, a most ingenious lithotomist, made a journey to London on purpose to see Mr. Cheselden cut for the stone. Since that time, they have not only endeavoured to introduce his method in Paris, but have even published to the world several accounts of the manner of performing it: Of these I have seen three or four, which though they all con-

tain many of the essential parts of his operation, (for a reason which none can be at a loss to guess, and which I need not to mention) yet there is something wanting in every one of them; I resolved therefore, for the credit of the English surgery, and of the operation itself, wherever it may hereafter be put in practice, to give, once for all, Mr. Cheselden's whole method of proceeding in it, without distinguishing what he has in common with the other ways, or what he has retained of his first manner, from what he has thought fit to introduce in this.

And, If I may judge from the accounts which have hitherto appeared, this detail will be of some use even to the Parisian surgeons themselves, notwithstanding they have the best opportunities in the world of making the necessary experiments for every operation; but it must infinitely be more so to surgeons of other places, both at home and abroad, who have not such advantages, or have them but seldom: Neither is this all; for though, upon a transient view of my description, many things may appear at first sight to be the same, in this new method, with what they are in the other ways of cutting; yet, on a more attentive comparison of both, I believe it will be found, that almost in every step of the operation, as well as of the method of cure, Mr. Cheselden has added something of his own, which, though they may not all perhaps be looked upon as peculiar to his present manner, ought, at least, to be regarded as improvements of the old ones.

I need not mention how much I am obliged to Mr. Cheselden for the chief materials of this paper; it was impossible to draw it up to good purpose without him; and since he has been so kind as to communicate to me, with the greatest readiness, and without reserve, all the particulars which I could not otherwise have come to the knowledge of, I am confident, that none will pretend to dispute but what I here describe is his operation, and his whole operation.

The particular enumeration of the parts concerned in his method; the comparison of it with the old way, to shew its advantages; together with the explanation of the figures of his instruments; are entirely my own, and, I hope, will need no apology.

The Editor has great satisfaction in adding to this Preface a short extract from the notes which Mr. Cheselden has subjoined to Mr. Gataker's translation of M. Le Dran's Operations of Surgery, published several years after Dr. James Douglas' death; as from this extract it will appear that Mr. Cheselden had taken that opportunity to pay a just and well-merited tribute of respect to the memory of the man who had been the faithful historian of his improvements in operating for the stone. "I had," says Mr. Cheselden, "this account of herniae from the late Dr. Douglas, a most industrious anatomist, very communicative, and much to be relied on, who was very clear they did not descend with the spermatic cord; but, from the appearance, thought the whole was a production of the Peritoneum. The present cases I have from Mr. Hunter, (the late Dr. William Hunter) a pupil of his, who dissected many of those which were shewn me by the Doctor, and who, to all the good qualities of his great master, has added that of true philosophy." See Gataker's translation.—EDITOR.

MR. CHESELDEN'S

METHOD OF CUTTING

FOR THE

STONE.

THE learned Professor Albinus, having published an excellent description of M. Rau's method of cutting for the stone, which he was so good as to present me with, I drew up a short abstract thereof, and communicated it to the Royal Society. From that time, our lithotomists beginning to think seriously about this method, it became the subject of frequent conversations and experiments amongst many of my ingenious friends; and this insensibly engaged me to compile a particular account of all that had been formerly done about it, which was soon after published in a treatise called, "The History of the Lateral Operation;" in which I began by a collection of all that I could meet with in books concerning the famous Frere Jacques, and his manner of cutting. I next explained the improvements thereof proposed by the ingenious M. Mery, and afterwards those actually introduced by

Professor Rau; and I concluded with the alterations made in it by Mr. Cheselden, when it came to be practised in our hospitals. Since that time Mr. Cheselden has, for very good reasons, laid this method aside, and substituted another, very different, in its room, which he now practises with great applause, and vast success, having saved 50 patients out of 52, whom he cut successively in St. Thomas' Hospital. This new Lateral Operation is what I have here undertaken to describe; and that under the following heads, and in the same order in which the like chirurgical operations are commonly described by authors, viz.

I. A description of the instruments he makes use of.

II. The dressings, and every thing else that is to be got ready before the operation begins.

III. The preparation of the patient's body.

IV. The way of performing the operation itself.

V. The method of cure.

To these I will add,

VI. A particular enumeration of all the parts cut, or any other way concerned in this lateral section.

VII. A comparative view of this operation with that of Marianus, now generally called the old way, founded chiefly on the structure of the parts; and from the different management of these in each method, I will endeavour to shew the numerous advantages which must attend that of Mr. Cheselden.

I. THE INSTRUMENTS.

His instruments, which indeed he seems to have carried to a very great perfection, whether we consider their small number, their lightness, their simplicity, or how well they are fitted for their several uses, are no more than five in number, viz.

1. A staff, or grooved catheter.
2. An incision knife.
3. A gorgeret.
4. A pair of forceps; and,
5. A crooked needle carrying a waxed thread.

1. The staff consists of a handle and grooved part. The handle is entirely straight, beginning by a smooth flat plate in form of a longish heart, which, in one fitted to a man full grown, for they are of different sizes (as all the rest are) proportioned to the age of the patient, is near one inch and a half in length, and an inch in breadth at the basis; the rest of the handle is round and solid, four inches and three quarters in length. To the extremity of this the grooved part is joined, which by a thread laid along it, measures five inches and a half. The *sulcus*, or groove, is remarkably deep and wide, the edges smooth and blunt; one end of it reaches a little way down on the handle, and the other, ending in an obtuse point, is without any check, as is seen in your common staffs. This part may again be divided into a curved portion and a straight *rostrum*, or beak. The curvature

next the handle not very great, and extends but a little way back from it; and from the extremity thereof, the long *rostrum* projects almost directly forward. He chuses to have his staff made of steel, because the rubbing of the gorgeret against it is better felt by the operator, than if it was of silver, which is a softer metal. Besides, a steel staff will allow of a larger groove than a silver one of the same size, without being too much weakened thereby.

2. The knife is about seven inches in length, of which a pretty thick and flattish wooden handle takes up four inches and a quarter; the blade is divided into a blunt shoulder and edged part. The shoulder is about half an inch in length, and something less in breadth, being every where of an equal thickness. The greatest breadth of the edged part is much the same with that of the shoulder; the edge itself is gently convex, ending in a sharp point, formed on the opposite side by the sloping of the back for about half an inch next this end. The back near this point is made thin enough to run freely in the groove of the staff; the rest is rounded and well polished, that it may slide the easier in the groove when he has occasion to use it that way.

3. The gorgeret, or gorget, is a smooth, thin plate of steel, consisting of a concave or hollow part and an handle. The deep, hollow, grooved part, to which the back or convex side exactly answers, is an inch in breadth at the handle, and from thence decreases regularly in breadth all the

way to the other end, which is narrow and rounded backward, being about three-eighth parts of an inch towards the convex side, but running down about as much more through the middle of the groove. The whole length of the groove is five inches and a quarter, the upper wide extremity goes sloping towards the handle, which is fixed to the other side at an obtuse angle, that so it may lie out of the way of the operator's hand and forceps. This handle is flat, increasing a little in breadth towards its rounded extremity, and is about two inches and a half in length.

4. The sizes of the forceps are different, as well as of the staff, and, for the same reason, the longest that I have ever seen Mr. Cheselden use was about twelve inches; the chops of it are outwardly convex, both according to their breadth and length, and inwardly concave, or a little hollow, the joint being so contrived, as to hinder the chops from shutting close at the ends, and so prevent the danger of pinching the bladder. The insides of them are toothed for about one third of their length, next the extremity; the rest is smooth, that in case the stone should be laid hold off thereby, it may more easily slip down to the rough part, where it is both more firmly and more advantageously held: When the forceps is shut, the greatest circumference of the chops is about three inches. They increase a little in breadth from the joint to the rounded ends, and are three quarters of an inch at the broadest place; their length is three inches and a half in a straight line. The two sides of the handle are

straight for above half their length, from the joint downward; then they divaricate outward in a bending manner, that they may be more firmly held, and terminate one in a ring for the operator's thumb, the other in a deep kind of hook for his fingers.

In a smaller pair of forceps which I measured, the length was about nine inches; that of the chops near three inches; breadth half that of the largest pair, and circumference about an inch and three quarters. This pair he calls his favourite forceps; and it is but seldom that he is obliged to make use of any other.

5. The crooked needle is not much different from the common; it is bent into an arch that makes about the third part of a circle, that so it may pass the easier. The thread with which he ties the vessels, is of the same sort that the shoemakers use, which being waxed, makes the smoothest and strongest ligature.

		Ounces.	Drachms.	Grains:
The staff	} weighs	1	3	—
The knife		—	6	—
The gorgemet		1	3	—
The forceps		12	1	—
The needle		—	—	16

N. B. The small forceps weighs only six ounces.

All these instruments, being first duly prepared and fitted for use, are laid in a broad, flat, earthen dish, filled with warm water, and placed on the right hand of the operator, where an assistant

stands ready to deliver them to him as he calls for them, being first wiped dry, and to take them back as soon as he has done with them.

II. THE DRESSINGS.

The Dressings required to be got ready before the operation, consist only of a few pledgets, some of them spread with a digestive made of equal parts of common turpentine and linseed oil, and one third part of yellow bees-wax; styptic water in a phial; sweet-oil in a saucer; a bit of sponge, and a bundle of tow. All these are laid in another flat earthen dish set near the former.

III. THE TABLE.

A convenient Table, upon which the patient is to be cut, is likewise to be got ready. It is made of a square, thick piece of wood, three feet and a half in length, and about two and a half in breadth, supported sometimes only by two tressels with three feet, but most commonly, which is better, by a quadrangular frame, three feet high, fixed to the floor in a good light, and where the assistants can easily stand round it. For this purpose, it is best placed obliquely, pretty near a window, so that the rays may fall directly on the left side of the *perinaeum*, and the operator's hand not lie in his own light. This table is covered with several doubles of a thick blanket nailed to its sides, over

which a clean coarse sheet is thrown and bound down by a swathe cross its middle; at one end is laid a small pillow, and over the other the sheet hangs down, and upon it is commonly thrown another cloth that is removed, and a clean one laid on, if he cuts more than one at a time.

THE PREPARATION OF THE PATIENT.

All the preparation Mr. Cheselden thinks needful, is, to give the patient a gentle purge the day before he is to be cut; and if it should not work sufficiently, he directs a common clyster to be given in the evening, to empty the lower wide part of the rectum, which being filled and distended with faeces, might be in danger of being hurt in the operation.

THE OPERATION ITSELF.

Every thing necessary being in this manner got ready, the patient, in a loose night gown, his head and legs covered, but nothing tight about his neck or belly, is brought from the cutting ward in the hospital to the theatre, for here I suppose the scene of action, and laid on the table, his head resting on the pillow, and his hips on its lower edge. In this situation he is tied, as in the greater apparatus, that is, his wrists are gently brought down to the out-sides of his ancles, and secured there by proper

bandages, his knees having first been bent, and his heels brought baek near his buttoeks: then, his thighs being raised and separated from one another, he is kept in this posture by two assistants (commonly apprentices to some of the hospital surgeons) during the whole time of the operation, they holding his ancles with one hand, and his knees with the other: there is one more standing at his shoulders, in order to prevent his rising up or retiring from the operator while he makes the ineision.

Then Mr. Cheselden, standing before the patient at the end of the table, takes the catheter, first dipped in oil, and introducees it in the usual manner through the urethra into the bladder, where having searched for and discovered the stone, he delivers it to one of his fellow surgeons standing on his right hand, whom he desires first of all to satisfy himself whether there be a stone or not; and then this assistant, holding the handle between his fingers and thumb, inclines it a little towards the patient's right thigh, drawing the convex side close up to the os pubis, near the commissure or joining of the bones, to remove or bear up the urethra as far as may be from the intestinum rectum, being frequently desired by Mr. Cheselden, not to push it down, nor make the convex or grooved side thrust the parts forwards or outwards towards the perinaeum; for though by so doing the place of the external wound would in some measure be ascertained, and the groove of the eatheter be more easily found in making the internal one; yet the

danger of bringing the urethra nearer the rectum, which, in that case, is more liable to be cut, does more than counterbalance these seeming advantages. Besides, in his method of operating, there can be very little occasion for any such contrivance, were it attended with no inconveniency, the external wound being very large and deep.

The staff being fixed in this situation, and its grooved part being turned outward and laterally, Mr. Cheselden sits down in a low chair, and drawing the patient nearer him, till his buttocks reach a little over the edge of the table, his feet being quite off from it, takes his knife, which he sometimes arms with a little tow rolled about it, to prevent his fingers from slipping when it becomes wetted with the blood, and holding it firm in his right hand, his thumb on the inside of the blade, his fore finger on the outside opposite to it, his middle finger on the outside of the handle, and the extremities of the rest on its upper edge. Then distending and keeping steady the skin of the perinaeum with the thumb and fore finger of his left hand, he makes the first or outward incision, through the integuments from above downwards, beginning on the left side of the raphe or seam, between the scrotum and verge of the anus, almost as high up as where the skin of the perinaeum begins to dilate and form the bag that contains the testicles; and from thence he continues the wound obliquely outwards, as low down as the middle of the margin of the anus, at about half an inch distance from it near the skin, and consequently be-

yond the great protuberance of the ischium. The first or upper part of this incision is but superficial; after that he plunges his knife much deeper by the side of the rectum, and finishes it by drawing his knife obliquely towards himself; these three motions may always be observed in his external incision, but the last is performed pretty much at random, there being here no danger of doing any mischief; and indeed I have, however, often observed that he is very little solicitous about the precise place and limits of the external wound, for I have seen him sometimes cut the skin much nearer the anus; sometimes at a greater distance from it; sometimes he begins the incision very high up, at other times lower down (and all this variety in patients of the same bigness or size;) but his intention and principal design is to make the wound as large as he can with safety, always avoiding to wound the vesicular membrane of the scrotum.

Having cut the fat pretty deep, especially near the intestinum rectum, covered by the sphincter and levator ani, he puts the fore finger of his left hand into the wound, and keeps it there till the internal incision is quite finished; first to direct the point of his knife into the groove of his staff, which he now feels with the end of his finger, and likewise to hold down the intestinum rectum, by the side of which his knife is to pass, and so prevent its being wounded. This inward incision is made with more caution and more leisure than the former.

His knife first enters the groove of the rostrated or straight part of his catheter, through the sides of the bladder, immediately above the prostata, and afterwards the point of it continuing to run in the same groove in a direction downwards and forwards, or towards himself, he divides that part of the sphincter of the bladder that lies upon that gland, and then he cuts the outside of one half of it obliquely, according to the direction and whole length of the urethra that runs within it, and finishes his internal incision, by dividing the muscular portion of the urethra on the convex part of his staff.

When he first began to practise this method, he cut the very same parts the contrary way; that is, his knife entered first the muscular part of the urethra, which he divided laterally from the pendulous part of its bulb to the apex, or first point of the prostate gland, and from thence directed his knife upward and backward all the way into the bladder; as we may read in the Appendix he lately published to the fourth edition of his book of Anatomy. But some time after he observed, that in that manner of cutting, the bulb of the urethra lay too much in the way; the groove of the staff was not so easily found, and the intestinum rectum was in more danger of being wounded.

A sufficient opening being made, Mr. Cheselden rises from his chair, his finger still remaining in the wound, and calling for the gorgereet; he puts its beak into the groove of the catheter, and so thrusts it into the cavity of the bladder, where he is often

at once sensible of the stone, which thus becomes a direction to him when he uses his forceps.

This done, he draws out the staff, and holding the gorgeret in his left hand, he introduces the forceps, the flat side uppermost, sliding them with great caution along its concave part, nicely observing when they pass the wound into the wide part of the bladder, and then he withdraws the gorgeret, and taking hold of the two branches of the forceps with both his hands, he searches gently for the stone; they being still shut, and having felt it, he opens them, and endeavours to get the undermost blade under the stone, that it may fall more conveniently into their chops, and so be laid hold of; which being done, he extraets it with both hands, one upon the ends of the foreeps, the other about the middle, but with a very slow motion, to give the parts time to stretch and dilate, which he promotes by turning the forceps gently in all direetions, taking all possible care that it may not slip; of which if he perceives any danger, he endeavours to reeover it again without pulling his forceps out.

If the stone is pretty large and smooth, and lies in that sinus of the bladder on the same side with the wound, he draws it out with the greatest facility imaginable, in subjects of all ages. But when he observes that the stone is either very small, or does not lie right to the forceps, he immediately pulls them out, and introducing his finger into the bladder, he tries to turn it, and to disengage it from the folds of the inner membrane, in which it is

sometimes entangled. Then he thrusts in his gorgeret upon the upper side of his finger; which being drawn out, he turns the gorgeret, and introduces his forceps, and so extracts the stone; but without any manner of hurry or precipitation.

To preserve a soft stone from breaking during the time of extracting, he puts one or more of his fingers between the branches of his forceps, to prevent any greater pressure upon it, than what is just necessary to hold it together. But if notwithstanding all his care, a soft stone happens to break, or where there are more than one in the bladder, he extracts the single stones or fragments one after another, repeating the introduction of his fingers and of the forceps, either upon that when it can be done, or upon the gorgeret, as often as there is occasion. I have sometimes seen him extract two stones, engaged in the chops of the forceps at the same time.

One needs not be surprised at the frequent introduction of the forceps and fingers, which is absolutely necessary upon some occasions; for it is never attended with any bad consequence when cautiously managed, that is, when due care is taken not to thrust the forceps so far in as to wound or bruise the bladder, or to perforate the same (which is always mortal) in the opposite side. We ought likewise to be very cautious that we do not pinch the whole substance of the bladder, or some of the plicae of its inner coat only, which is very difficult to avoid, when some fold of it lies very close to the

stone; in which case it may easily be torn off and drawn out together with it.

He performs this operation with so much dexterity and quickness, that he seldom exceeds half a minute, unless when he is obliged to take up and tie the vessels before the stone is extracted, or when there happens to be something uncommon in the stone itself.

THE METHOD OF CURE.

Under this general head I comprehend,

I. The accidents that either happen immediately after the operation is over, or before the cure is finished.

II. The method of curing the wound.

III. The regimen or diet of the patient during his illness.

The first symptom or accident that sometimes happens before the person is put to bed, is a flux of blood from the divided arteries. As soon as Mr. Cheselden perceives this, he presently takes up the vessels with the crooked needle, and ties them with a ligature made of waxed thread, drying the wound with a bit of soft sponge wrung out of warm water, that so he may the more readily discover the orifice of the vessels, and see if any more bleed, which are afterwards to be tied separately one after ano-

ther. It sometimes happens the flux of blood is so great upon making the external wound, as to endanger the patient, he is obliged to tie the vessels before he extracts the stone. But if from the continued haemorrhage or flux, when all the external vessels are secured, he apprehends that it must proceed from the division of some of the arterial branches that are ramified on the membrane, which covers the prostate gland, he thrusts up a small pledgit or two dipped in a styptic liquor, which seldom fails to check it, though the parts affected remain altogether free from compression.

The other bad symptoms and accidents that may happen after the patient is carried to his bed, whether from the patient's ill habit of body, want of due preparation, either in diet or any other cause, are very numerous in all the methods of Lithotomy, as may be seen in authors who treat of that subject. But as none of these are peculiar to Mr. Cheselden's operation, I shall only mention a few of the most remarkable, and chiefly of such in curing of which he has made some new observation or successful experiment.

If there should be any tension, inflammation, or swelling in the abdomen, which has never yet happened to him in any considerable degree, though it frequently happens to those that are cut the old way, he thinks it would be very proper to throw up a clyster; and if that does not answer, he would give a gentle purge. But if these symptoms should continue, and be attended with violent pain, he

says a quieting draught may be given. But what I would chiefly observe here is, that this is the only case in which Mr. Cheselden does allow of an opiate; because he says all opiates or sleepy medicines do not only hinder a regular digestion, but even put a check to it when begun.

If either before or after the suppuration appears, he perceives the pulse to flag, or be too slow, he presently applies a vesicatory to the arms, which he says is likewise of excellent use to promote digestion, by warming and increasing the motion of the blood; and he observes that it is but seldom attended with any strangury or pain in making water,

If he observes any great foulness in the wound, he mixes a little verdigrease with the common digestive, with which he dresses.

And, in the last place, if the wound becomes hard, callous, and fistulous, he dresses its lips with a little bit of blistering plaster, which removes the hardness and dryness, and soon disposes the wound to new granulations, and in a short time completes the cure.

II. The method of curing the wound is much the same as in all simple wounds, for in this manner of working there are no bruises nor contusions, (which always retard the cure) to be taken care of.

Before the patient is removed from the table, pledgits, covered with the common digestive, are applied to the lips of the wound, where they are secured and held on by the hand of a servant, who assists in carrying him to bed, and afterwards very

slight bandages are only made use of to keep them on.

These dressings are changed twice a day, and continued without any great variation till the wound begins to cicatrize. Afterwards he applies a little dry lint no bigger than the wound, and over that the common pledgit.

As to their diet, that is only weak broth, sage tea, sack whey, a bit of bread and butter in a morning, &c. This low regimen is to be ordered for the first four or five days; but as soon as laudable matter is formed, and a good digestion appears, a bit of boiled chicken may be allowed once a day, and then any other sort of fresh meat in a small quantity.

To prevent being costive, water gruel with plumbs is good to keep the body open: but if he has not had a stool before the fifth day, a clyster may be given.

The suppuration commonly begins about the fifth day, unless in a patient of an ill-habit of body; where the scalding of the urine, especially in hot weather, hinders it.

In children the urine comes wholly by the urethra about the 14th day, and in men about the 20th; but in both some part of it passes that way several days sooner, the rest still coming through the wound.

In six weeks time adult persons are often perfectly cured; and for children, they are generally well in half that time.

THE PARTS CONCERNED.

I come now to the sixth part of my design, the enumeration of the parts concerned in this section: These I have had several good opportunities of examining in dead subjects, upon which Mr. Cheselden was so kind as, at my request, to perform his operation. I once likewise opened the body of a patient who had been cut by him for the stone, in which I found the parts divided in the very same manner in which they were cut in the dead bodies I had dissected.

The parts he cuts are,

1. The common integuments of the perinaeum, and a little farther back between the protuberance of the os ischium and extremity of the os coccygis, that is, the cuticula, cutis vera, and the membrana cellularis or adiposa.

2. He divides sometimes the subcutaneous portion of the sphincter ani, that is spread for some space from its limbus or orifice, immediately under the true skin, lying on the fat.

3. Next under the integuments, if his incision begins high, he cannot always avoid that lateral part of the constrictor urethrae, (accelerator urinae) that is closely joined to the erector penis, but he must always cut that portion of the same muscle that lies on the ligamentum transversum.

4. The *musculus transversalis urethra*, (*perinaei*) in passing over the last mentioned ligament, in subjects where that muscle is found, must likewise suffer.

5. He next divides that triangular, broad, tendinous, strong ligament, which runs between the rami of the *ossa pubis*, laterally, above it adheres to the ligament that touches these bones at their commissure, but chiefly to the *crura corporis cavernosi penis*, and below, to the upper part of the *sphincter ani*. In the middle of this tendinous kind of septum there is a large round perforation for the passage of the membranous narrow part of the urethra covered with its muscle; and from this perforation or hole it is divided obliquely all the way to its lower edge.

6. Under this ligament, upon part of the *levator ani*, the *prostatae inferiores* are situated, commonly known by the name of Cowper's glands; one of which, or, at least, the large duct that goes from it, and enters the membranous portion of the urethra, can never escape being cut.

7. He divides in a pretty oblique direction a large portion of the *levator ani*, that lies on the inside of the *ligamentum pubis transversum*. It is, however, possible to divide a good deal of the prostate without cutting this muscle quite through; but if he enters the substance of the bladder first, it must be quite divided.

8. In cutting the parts above-mentioned, he cannot miss dividing several arterial twigs that come from the great vessel, called *arteria pudenda*,

which parts from the arteria iliaca interior, within the pelvis, but without the peritoneum; whence, passing through the great sinuosity of the ischium, and over the sharp process of that bone, it is carried along the inside of the ramus of the os pubis to the dorsum penis, where it terminates near the glans.

9. He cuts likewise some nervous twigs, which proceed from a small branch that proceeds from some of the nerves that pass through the uppermost hole in the foreside of the os sacrum, and, together with more, constitute the great ischiatic nerve; this runs the same way towards the glans of the penis, in close conjunction with the artery.

These, I believe, are all the parts through which a large passage is made to the iter urinae, or canal that leads to the cavity of the bladder: But as Mr. Cheselden does not always make his outward wound precisely in the same place, some small variety, that is no ways material, may happen with respect to some of them.

The internal wound is through the bladder, prostate gland, and urethra.

1. The vesica urinaria, covered with the membrana cellularis, is cut in two places, viz. first a small portion of it a little above the prostate gland, on the left side, where he enters the knife first into the groove of his staff, and then part of the bladder which lies round the orifice upon the upper part of that gland.

2. The substance of one half of the prostate gland is likewise divided laterally from without, inwards in the direction of the urethra that lies within it, through the whole length of that part of the canal.

3. The iter urinae, or canal of the urethra, is divided in two places, and both laterally: First, the beginning of it, which runs through the substance of the prostate lengthways, at the same time the incision is made through it, and the urethra, into the groove of the staff.

The next is the membranous part of the urethra, with the circular muscle that surrounds it, beginning at the inferior apex of the prostate, and ending a little beyond the hole in the septum tendineum, under the pendulous part of its bulb.

4. When the prostate gland is divided near the rectum or back part of the pelvis, a large, straight, arterial branch can seldom escape the knife; but the small twigs that are ramified most plentifully on the capsula of that gland, are always divided wherever the wound is made.

5. The nervous twigs that accompany the arteries, are likewise cut in this place.

To this short enumeration of the parts, one observation may be added, which is, that if the operator turns the edge of his knife too far backwards, and then raises it to cut, he can scarcely be able to avoid wounding the intestinum rectum pretty high, some part of the vesiculae seminales next the prostate, and the verum montanum within the urethra, that runs through that gland, together

with a larger portion of the levator ani anterior, and of the ligamentum suspensorium vesicae, that closely embrace it. The lowest part of the intestine rectum, near the sphincter, may likewise be cut. These, therefore, may be mentioned as parts to be avoided in this method of cutting; but the truth of the matter is, none of them can be in any great danger, while the operation deserves the name it goes by, that is, while the parts proposed to be cut are all divided laterally.

MR. CHIESELDEN'S METHOD, COMPARED WITH THAT OF MARIANUS.

I come, in the last place, to compare Mr. Cheselden's operation with the Apparatus Major, or that of Marianus, in which the incision is made in the perinaeum, on one side the raphe, and in the same direction with it, ending a little above the anus. The constrictor urethrae is next divided, together with an elongation of the sphincter ani, and afterwards a passage is opened into the urethra, through its corpus spongiosum and bulb, all the way down to the beginning of the membranous part, and this in the same direction with the wound in the integuments, for which the grooved catheter serves as a guide, the handle of it being held almost perpendicular to the patient's body by an assistant.

The incision being finished, two conductors, or a gorgeret, are passed through it into the groove

of the staff, and upon that are introduced through the long, narrow, crooked canal of the urethra, into the cavity of the bladder. Then the staff being drawn out, the forceps is thrust in upon the gorgeret, or between the conductors, which being afterwards removed, the operator lays hold of, and extracts the stone in the best manner he can.

In this operation, therefore, the foramen in the transverse ligament, the membranous part of the urethra, covered with its muscle, and that other portion of it, which lies within the prostate, the prostate gland itself, and the orifice, with the sphincter of the bladder, must be first excessively dilated, and afterwards, most commonly, if not always, dilacerated. These are likewise the principal parts concerned in Mr. Cheselden's operation; and therefore, in order to shew the advantages thereof, it could not have been so well compared with the high way, or that of Professor Ran (in both which the parts concerned are vastly different) as with that of Marianus, because from the different treatment of these parts in each operation, as well as from some other considerations arising from thence, the excellency of the one above the other will clearly appear.

The first general class of advantages in Mr. Cheselden's operation, above that of Marianus, arises from the nature of the wound made in both, that is, from its size, situation, and distance from the stone or cavity of the bladder. In Marianus' operation, the wound being necessarily very small, the management of the instruments, and especially of

the forceps, must be much more difficult than in Mr. Cheselden's, where a large outward incision affords room enough to turn them in any direction that can be desired. In the next place, the largest stone will easily pass through Mr. Cheselden's wound; but in the old operation, a stone larger than the diameter of the wound, as it frequently happens to be, must, when it is brought as far as the skin, force that outwards along with it, and so, besides the difficulty this causes in the extraction, break and disorder the texture of the cellular membrane, immediately under or within it; the consequence of which must be obstructions and other disorders, which being communicated to the serotum, dangerous inflammations, tumours, and even mortifications, may happen in that tender part. There are instances, indeed, of very large stones extracted in the old way, but then, the constitution of the patient has been good enough to ward off the fatal effects of the accidents I have mentioned; or the operator has ventured to enlarge the outward wound by an oblique incision through the integuments, before he could draw out the stone. In the third place, a large external orifice mightily facilitates the cure, by allowing free room for a discharge of matter, and affording a larger quantity of that gleet, as it may be termed, which is the fore-runner of digestion; and likewise preventing the danger of a mortification, always to be feared when the orifice is small, whereby the humours are pent up and checked in their course.

This discharge is very much promoted by the situation, as well as by the size of the wound, in Mr. Cheselden's operation, where it is much lower than in the other, and consequently the orifice more depending, which is justly esteemed a capital advantage in the cure of all wounds, whether accidental or designed. Again, in Mr. Cheselden's way, the stone passes between the rami of the ossa pubis and ischii, near the great protuberance of the last named bone; and where they are most distant from one another, and consequently cannot create any difficulty in extracting it, let it be never so large: Whereas in the old way, the situation of the external orifice makes it necessary that the stone should pass much nearer the angle by which the ossa pubis are joined together, through a much narrower space, so that a large soft, or brittle stone, must infallibly be broken in its passage, and a hard one be forced lower down, to the great detriment of the soft parts concerned; or there must be a contusion of that strong ligamentary substance, situated in the angle formed by the ossa pubis, upon which the urethra lies, and by which the thalamus penis, as it is termed by Sanctorius, is much enlarged. The same accident may happen to a pretty large nerve and arterial branch in their passage over this ligament, up to the dorsum penis.

The distance between the wound and cavity of the bladder where the stone lies, and the curvature of that part of the urethra that goes between these, in Marianus' method, has been the source of a new train of melancholy accidents. Thus in thrusting

in the gorgeret or conductors, the membranous part of the urethra has often been perforated, and so the way to the bladder altogether lost, the instrument passing on between the prostate gland and intestinum rectum. The consequences of this accident, especially if not speedily perceived, are very obvious; but even after the operator has discovered his mistake, and actually recovered his way into the bladder, if his instruments are much resisted in any part of their passage, especially at the prostate and orifice of the bladder, the urethra may be quite torn asunder at the perforated part, and be intirely separated from that gland. But as this canal is managed in Mr. Cheselden's way, all possibility of this accident is avoided. Again, there is so much difficulty and force required to thrust the instruments into the bladder, and withal so much uncertainty how far they may safely go, that before the operator can stop his hand, he often wounds, and sometimes perforates the opposite side of the bladder, than which no accident attending this operation, can be more dangerous; but it is not much to be feared in Mr. Cheselden's way, in which all these difficulties and uncertainties are taken off. When at length, the forceps is safely got into the bladder through a long, narrow, crooked passage, which incumbers the operator very much in the management of them, he must often meet with more difficulty than Mr. Cheselden ever can, in laying hold of the stone at all; in laying hold of it in the most advantageous manner; and in extracting it without breaking or letting it slip. He is

likewise in much greater danger of pinching the bladder either with or without the stone, especially when the cries of the patient augment the pressure on its upper side, and force it downwards; and accordingly, experience has shewn, that by this accident, the whole bladder has been drawn out along with the stone.

The next general series of advantages arises from the different treatment of the parts that lie between the external wound and cavity of the bladder, and that both in respect of the facility and safety of introducing instruments, and extracting the stone, and of the consequences to be dreaded from the contusion and dilaceration of the parts. In Mr. Cheselden's operation, where all these parts are divided by the knife in the manner already said, and the external incision made very low down, a direct passage is opened into the bladder; whereas in Marianus' way, where the situation of the outward orifice obliges the operator to follow the whole curve direction of the urethra round the arcade of the os pubis, the introduction of the instruments must, upon that account, be extremely difficult: But that difficulty is still very much augmented by the size of the instruments and stone compared with the narrowness of the canal, the resistance of the ligamentum transversum, prostate gland, and sphincter of the bladder; all which being artfully divided in Mr. Cheselden's way, this resistance is taken off, and the introduction of the instruments, and extraction of the stone, rendered perfectly easy. Again, in strong-contracted bladders,

whether from their natural structure or effect of the disease, the orifice surrounded by the prostata, has been found to resist the introduction of the instruments so much, as that before it gives away, the longitudinal fibres of the bladder that arise from the ossa pubis, have been torn from their origins, and so rendered incapable of acting ever afterwards; and likewise the tendinous membrane that is spread from the ossa pubis over the prostata and bladder, very much disordered; but when the orifice of the bladder, is previously divided, nothing like this can happen; neither is it ever to be feared, that the sphincter muscle should lose its elasticity or power of contraction, and so remain paralytick, as often has been the case, from its being too forcibly dilated in Marianus' operation, by which an incontinency of urine is entailed on the patient for life; for in Mr. Cheselden's operation, the sphincter of the bladder is cut in its natural state, and so will readily unite again; but in the apparatus major, the dilaceration thereof happens after the fibres have been stretched and dilated to their utmost extent, and consequently reduced to a state in which they can never recover themselves for the future.

Contusions and dilacerations of the parts come next to be considered. These are unavoidable in Marianus' way, and the dilaceration must not only always be made at random, but often in different places at once, of the same part; the canal of the urethra, for instance, being first dilated by the instruments to its utmost extent, must afterwards break in the weakest part, on whatever side that

lies; and if it be all equally strong, and equally dilated, it will be torn in two or more opposite places at the same time; whereas in Mr. Cheselden's way, could any such dilaceration happen, it must always be on the wounded side only. And indeed this new operation is principally founded on the difference of wounds by incision, and those by rupture or dilaceration, the latter being, according to Celsus' maxim, by far the most dangerous. And from hence it is, that in Marianus' operation the cure is rendered much more tedious and uncertain, because of the previous suppuration that is required, and the danger there is of a mortification before that can be brought on; but when the same parts are cut with the knife, they unite again very speedily, and the wound is cured almost by the first intention. Another accident which may happen from this contusion and tearing of the parts, is, that they may be so far shattered and broke, as that a considerable loss of substance must necessarily attend the suppuration, and the wound never afterwards uniting, the sides growing callous and hard, a fistula remains, and from thence an ineontinency of urine. "*Multo patientiorem fistulam habiturus est,*" says Celsus, "*rupta cervice quam habuisset incisa.*" From this same source of contusions, the ducts of the vesiculæ seminales, that enter and run through the back-side of the prostate gland, and open into the urethra, may be so far disordered, as never to be able to recover themselves, upon which impotency must ensue. But none of these accidents can happen in Mr. Cheselden's operation, except

from such gross mistakes which every operator must be supposed always incapable of falling into.

On all these, and perhaps several other accounts, Mr. Cheselden's operation is preferable to that of Marianus ; but it must be further observed, that the inconveniences attending this last are not all of the same kind ; some of them arise from the very nature of the operation, and are such as no operator can possibly prevent : Others are more accidental, but then all the accidents here taken notice of, are such as have actually happened, and to which this method must always be much more liable than that of Mr. Cheselden. I will not, however, deny, but that the apparatus major, in its turn, may have some seeming advantages over the new lateral way.

Of these, two have been mentioned ; the first, that in the old way the operator holds the staff himself, and so may direct and humour it better for his own purposes than an assistant can possibly do. But this advantage loses much of its force when it is considered, that in Mr. Cheselden's way the staff is kept fixed and immoveable till he extracts it himself ; this any assistant can do as well as the operator, who being freed from this incumbrance, is more at liberty to go through the operation, especially to make the inward wound, in which both hands are required.

The other disadvantage will appear much more considerable. In Marianus' operation, when the blood vessels retain their common course, none are liable to be cut that can occasion an hæmorrhage of

any consequence, being only the small twigs ramified in the corpus cavernosum and bulb of the urethra; but in the lateral way several arterial branches, both external and internal, are divided, and a large flux of blood most commonly caused thereby. This is undoubtedly an inconveniency; but I have not heard that any bad accident has hitherto happened upon it, to any patient cut by Mr. Cheselden; the flux from the external branches being easily stopped by ligature, as that from the internal one has hitherto always been by him, by the use of a proper styptic.

POSTSCRIPT.

THROUGH the whole of this Appendix I have avoided saying any thing concerning the history of Mr. Cheselden's operation, neither have I at all endeavoured to determine how far the discovery thereof is to be attributed to him, or how far it may be ascribed to some other; my design leading me no farther, than to recommend his present most successful manner of cutting for the stone, and to describe it with all the accuracy I was capable of, that others may thereby be enabled to perform it. However, to give some satisfaction to those who are curious of such historical affairs, and at the same time to obviate the cavils, objections, and misrepresentations of the ignorant or invidious, I shall here set down a few matters of fact, together with the consequences arising from them, as far as they relate to Mr. Cheselden.

In his operation the external incision is in no material circumstance different from that directed long ago by Paulus Ægineta, Albucasis; and, indeed, by all the authors (Brunus and a few others of the darker ages excepted) who have wrote since Celsus, whose incision was quite different, con-

cerning the apparatus minor, or cutting on the gripe, as we now call it. And even the advantage of a large outward orifice, in order to facilitate the discharge of matter from the wound, is mentioned by Ægineta and De Franco, and particularly applied to the operation of lithotomy; yet I am well satisfied none of these were so large as those made by Mr. Cheselden.

Concerning the internal incision, we must likewise observe, that several authors, who describe the outward wound as already said, have also proposed that some of the parts, through which an immediate passage is opened by Mr. Cheselden into the cavity of the bladder, should be divided laterally. Of these, the most antient that I know of, is Petrus Franco, the celebrated author of the Hypograstric Section, which we now call the High Operation; and likewise the first lithotomist who joined the apparatus major and minor together in one operation; but then from the figure of his catheter especially, and from the directions he gives, it is very evident that he could divide the urethra no farther than the apex of the prostate; that gland, the urethra within it, and the orifice of the bladder, being in this operation left untouched by the knife. So that the whole improvement made by De Franco, consisted in cutting the urethra about one inch further than was done in Marianus' method, for it is now above thirty years ago that M. Mery told us, that in the apparatus major the incision was so far from reaching into the cavity of the vesica, that it really went no farther than the very

beginning of the membranous part of the urethra, just under its bulb. M. Thevenin, a surgeon in Paris, has made the very same observation in a book of surgery, which he published in the year 1658. This way of cutting is likewise mentioned by the judicious Hildanus, both he and Franco having actually performed it on living bodies: And I am very much of opinion that it has been frequently practised of late, both here and elsewhere, by those who have attempted to cut after Mr. Cheselden's manner.

A third author, who has very strenuously recommended a method like this of De Franco's, but, as far as I can learn, never put it in practice, is M. Mery, of the Royal Academy of Sciences; he proposes that the membranous portion of the urethra alone should be cut, the neck and body of the bladder being left entire, that is, in plain English, that the incision ought to reach only to the nearest part of the prostate, called its apex, as was done by De Franco 140 years before him. All that this accurate anatomist has added, to what is to be found in that author, and in Hildanus, is only a longer and more curved catheter, and a much better description of that part of the urethra which lies between its corpus cavernosum and prostate gland, together with the manner of using a particular kind of bistoury, with a pointed stilet fixed to it, which is not very easily understood, and will, I cannot help saying, never be used by any body.

I might have added something concerning Mr. Cheselden's instruments, and his way of employing them, as for instance, that De Franco's gorgeret and the point of the razor which he used for an incision knife, are something like his in their shape and figure; but waving these trifles, as being of very small consequence to the main point in question, I think it is evident, from what I have said, that the continuation of the internal wound through the side of the prostate, through that portion of the urethra which lies within it, that part of the bladder which lies upon it, with a small portion thereof above the gland, through which his knife first enters into the groove of the staff, are improvements owing to Mr. Cheselden, having never been proposed by any lithotomist before him that we know of; upon all which the excellency and success of the operation depends. It is true, indeed, that, as I have related at full length in my History of the Lateral Operation, that M. Mery mentions one experiment, made by the famous Frere Jacque, on a dead body, and which he afterwards opened, in which the very same parts were divided as in Mr. Cheselden's present way; but all this was merely accidental, owing to the ignorance of the Monk, and his want of attention, which made him often thrust his knife at random, quite out of the way by which he always purposed to get into the very body of the bladder. But what is still more surprising is, that though M. Mery was extremely pleased at this appearance, and seemed then to ground his approbation of Frere Jacque's method principally

upon it, yet, in the amendments which he afterwards contrived, he declares himself to be of opinion, that none of these parts, except the membranous portion of the urethra, ought to be cut. This author therefore can have no title to the discovery of any part of Mr. Cheselden's operation; the main advantages of which, consisting in artfully dividing these very parts that must be dilated, contused, and dilacerated, not only by the apparatus major, (as is well observed by that excellent surgeon, M. Le Dran, who, in my opinion, has lately given us the best treatise that ever was written on lithotomy) but also by that method proposed by De Franco, and improved by M. Mery; it is but reasonable to suppose, that it was the consideration of these advantages, founded on Celsus' doctrine about the difference of wounds by incision, and these made by rupture or contusion, and not by any hints that he might have had from them, which led him to the discovery of it. But the whole truth of the matter is this:

Mr. Cheselden had often observed, that the reason why fewer women died after the extraction of the stone, than men who were cut the old way, was entirely owing to the different texture of the parts through which the stone is drawn, and to the wrong management of these parts, much after the same manner in both sexes.

From whence he very judiciously inferred, that if he could once bring the parts in a male, to an equality in disposition with those that are dilated in a female, he should not at all doubt of having the

same success ; and indeed the event has abundantly answered his expectation. Now, in order to bring this about, he resolved for the future, previously to divide the parts that were capable of giving any resistance, and very subject to be torn ; that is, he cuts with his knife, and divides laterally the membranous part of the urethra, which is much narrower than in women ; the transverse ligament, which is vastly stronger than in women ; and the prostate gland, which in some subjects is very hard and firm, but in all is cased round by a tendinous membrane of a very compact texture ; and besides, as a capsula, binds its whole substance very close together. Thus, all the resistance being taken off, the parts readily yield, and the operation becomes equally safe in both sexes ; and thus this new method is free from some inconveniencies, which, even in women, must arise from too great a dilatation, and tearing the urethra and orifice of the bladder ; the sides of which he divides in men, and thereby prevents the danger.

Thus it plainly appears that Mr. Cheselden's operation, as now practised by himself, is not to be found altogether or complete in any one writer extant.

But, to conclude, Mr. Cheselden is much less solicitous for the credit of being an inventor, than he is to have his operation understood and practised in a right manner, for the good of the public. However, as his success in it, has been vastly greater than can be pretended to by any one, in any method whatsoever, it is but just that the world

should know to whom it owes so great an improvement in the art of surgery: which, as it affords great comfort to mankind, so does much honour both to himself and to our country.

COVENT-GARDEN, JULY 25, 1731.

FINIS.

A SHORT
HISTORICAL ACCOUNT
OF
CUTTING FOR THE STONE.

BY W. CHESELDEN,

Surgeon to his Majesty's Royal Hospital at Chelsea, Fellow of the
Royal Society, and Member of the Royal Academy of Surgeons
at Paris.

SHORT
HISTORICAL ACCOUNT
OF
CUTTING FOR THE STONE,

Copied from the last Edition which Mr. Cheselden published of his Anatomy,
containing an Account of his Third, or improved Manner of cutting.

THE most ancient way of cutting for the stone is that described by Celsus, which was indeed cutting upon the gripe, but in a very different manner from that operation in later ages, for he directs a lunated incision with the horns towards the coccyges, which was plainly that the gut might be pressed downwards to avoid wounding it, and then a transverse incision upon the stone might be made safely, but not in very young children, for want of room, nor after puberty, for then the prostatae are too large to allow of this operation; therefore they did not usually cut any younger than nine years, nor older than fourteen: Afterwards, but when we know not, this operation was improved by cutting lower, and on one side, which is the operation now called cutting on the gripe, or with the lesser apparatus.

In the year 1524, Marianus published the method of cutting by the greater apparatus, now commonly called the old way, but he owns it was invented by his master Johannes de Romanis.

In the year 1697, Frere Jacques came to Paris, full of reputation for the success of his new operation for the stone; he soon obtained leave to cut in the hospitals, where great numbers of his patients dying, and being dissected, they were found with their bladders cut through, guts wounded, &c. which brought the operation into disgrace, as Mery and Dionis have related, who saw these things. They say he performed the operation without any direction, and without any knowledge of the parts he was to cut; a thing not to be mentioned without horror! But of late his character has been set in a very different light; and though it is more than probable he himself knew not what he did, yet there are now, who pretend to tell us exactly; though if their testimonies are to be regarded, who saw him operate, there is no place that he did not cut one time or other, and therefore he may have a sort of right to be called the inventor of any operation for the stone that can ever be performed in these parts. It is also owned that he sometimes had great success, which was enough to put others of that nation upon trying of it in a more judicious manner; but if there were such, failing of success, they have concealed their experiments.

Mr. Rau of Amsterdam, who saw F. Jacques operate, professed to do his operation with the ne-

cessary improvement of a grooved staff, which if Jacques ever used, he surely learned that of Rau. He succeeded wonderfully; and if he, who was an excellent anatomist, may be allowed to understand his own operation, it was directly into the bladder, without wounding either the urethra or the prostates: Besides this, other competent judges, who were witnesses to his operations, have borne the same testimony.

In the year 1717-18, Doctor James Douglas, in a paper presented to the Royal Society, demonstrated, from the anatomy of the parts, that the high operation for the stone might be practised; which had been once performed by Franco injudiciously, and by him disrecommended, though his patient recovered; and afterwards strongly recommended, but not practised by Rosset. Yet no one undertook it, till his brother Mr. John Douglas, about three years after, performed it, and with great applause, his two first patients recovering. Soon after, a surgeon of St. Thomas' Hospital cut two, who both recovered; but the same gentleman afterwards cutting two, who miscarried by the cutting or bursting of the peritonæum, so that the guts appeared, this way immediately became as much decried as it was before commended; upon which the surgeons of St. Bartholomew's Hospital, who had prepared to perform this operation, altered their resolution, and went on in the old way. The next season, it being my turn in St. Thomas', I resumed the high way, and cutting nine with success, it came again in vogue; after

that every lithotomist of both hospitals practised it; but the peritonaeum being often cut or burst, twice in my practice, though some of these recovered, and sometimes the bladder itself was burst from injecting too much water, which generally proved fatal in a day or too. Another inconvenience attended every operation of this kind, which was, that the urine's lying continually in the wound retarded the cure, but then it was never followed with an incontinence of urine. What the success of the several operators was, I will not take the liberty to publish; but for my own, exclusive of the two before mentioned, I lost no more than one in seven, which is more than any one else that I know of could say; whereas in the old way, even at Paris, from a fair calculation of above 800 patients, it appears that near two in five died. And though this operation came into universal discredit, I must declare it my opinion, that it is much better than the old way, to which they all returned, except myself, who would not have left the high way but for the hopes I had of a better; being well assured, that it might hereafter be practised with greater success; these fatal accidents having pretty well shewn how much water might be injected, and how large the wound might safely be made. But hearing of the great success of Mr. Rau, professor of anatomy at Leyden, I determined to try, though not in his manner, to cut directly into the bladder; and as his operation was an improvement of Frere Jacques, I endeavoured to improve upon him, by filling the bladder, as Douglas had done in the high

way, with water, leaving the catheter in, and then cutting on the outside of the catheter into the bladder, in the same place as upon the gripe, which I could do very readily, and take out a stone of any size with more ease than in any other way. My patients for some days after the operation seemed out of danger; but the urine which came out of the bladder continually lodging upon the cellular membrane on the outside of the rectum, made foetid ulcers, attended with a vast discharge of stinking matter; and from this cause I lost four patients out of ten. The case of one which escaped was very remarkable: A few days after he was cut, he was seized with a great pain in his back and legs, with very little power to move them; upon which he turned upon his face, and rested almost constantly upon his knees and elbows above a fortnight together, having no ease in any other posture all that while; at length his urine coming all the right way, his wound soon healed, and he recovered the use of his back and limbs. I think all these severe symptoms could proceed from no other cause than the urine and matter somehow offending the great nerves; which come out of the os sacrum to go to the lower limbs. I then tried to cut into the bladder, in the same manner that Mr. Rau was commonly reported to do, but there had the same inconvenience from the urine's lodging upon the cellular membrane on the outside of the intestinum rectum. Upon these disappointments, I contrived the manner of cutting, which is now called the Lateral way. This operation I do in the following

manner : I tie the patient as for the greater apparatus, but lay him upon a blanket several doubles upon an horizontal table three feet high, with his head only raised. I first make as long an incision as I can, beginning near the place where the old operation ends, and cutting down between the musculus accelerator urinae, and erector penis, and by the side of the intestinum rectum : I then feel for the staff, holding down the gut all the while with one or two fingers of my left hand, and cut upon it in that part of the urethra which lies beyond the corpora cavernosa urethrae, and in the prostate gland, cutting from below upwards, to avoid wounding the gut ; and then passing the gorget very carefully in the groove of the staff into the bladder, bear the point of the gorget hard against the staff, observing all the while that they do not separate, and let the gorget slip to the outside of the bladder ; then I pass the forceps into the right side of the bladder, the wound being on the left side of the perinaeum ; and as they pass, carefully attend to their entering the bladder, which is known by their overcoming a straitness which there will be in the place of the wound ; then taking care to push them no farther, that the bladder may not be hurt, I first feel for the stone with the end of them, which having felt, I open the forceps and slide one blade underneath it, and the other at top ; and if I apprehend the stone is not in the right place of the forceps, I shift it before I offer to extract, and then extract it very deliberately, that it may not slip suddenly out of the forceps, and that the parts of

the wound may have time to stretch, taking great care not to gripe it so hard as to break it, and if I find the stone very large, I again cut upon it as it is held in the forceps. Here I must take notice, it is very convenient to have the bladder empty of urine before the operation, for if there is any quantity to flow out of the bladder at the passing in of the gorget, the bladder does not contract but collapse into folds, which makes it difficult to lay hold of the stone without hurting the bladder; but if the bladder is contracted, it is so easy to lay hold of it, that I have never been delayed one moment, unless the stone was very small. Lastly, I tie the blood-vessels by the help of a crooked needle, and use no other dressing than a little bit of lint besmeared with blood, that it may not stick too long in the wound, and all the dressings during the cure are very slight, almost superficial, and without any bandage to retain them; because that will be wetted with urine, and gall the skin. At first I keep the patient very cool to prevent bleeding, and sometimes apply a rag dipped in cold water, to the wound, and to the genital parts, which I have found very useful in hot weather particularly. In children it is often alone sufficient to stop the bleeding, and always helpful in men. The day before the operation I give a purge to empty the guts, and never neglect to give some laxative medicine or clyster a few days after, if the belly is at all tense, or if they have not a natural stool. What moved me to try this way, if I may be allowed to know my own thoughts, was the consideration of women scarce

ever dying of this operation; from which I concluded, that if I could cut into the urethra, beyond the corpora cavernosa urethrae, the operation would be nearly as safe in men as women.

What success I have had in my private practice I have kept no account of, because I had no intention to publish it, that not being sufficiently witnessed. Publicly in St. Thomas' Hospital I have cut two hundred and thirteen; of the first fifty only three died; of the second fifty, three; of the third fifty, eight; and of the last sixty-three, six. Several of these patients had the small-pox during their cure, some of whom died, but I think not more in proportion than what usually die of that distemper; these are not reckoned among those who died of the operation. The reason why so few died in the two first fifties was, at that time few very bad cases offered; in the third, the operation being in high request, even the most aged and most miserable cases expected to be saved by it; besides, at that time, I made the operation lower, in hopes of improving it, but found I was mistaken. But what is of most consequence to be known is the ages of those who recovered, and those who died. Of these, under ten years of age, one hundred and five were cut, three died; between ten and twenty, sixty-two cut, four died; twenty and thirty, twelve cut, three died; thirty and forty, ten cut, two died; forty and fifty, ten cut, two died; fifty and sixty, seven cut, four died; sixty and seventy, five cut, one died; between seventy and eighty, two cut, one died. Of those

who recovered the three biggest stones were 12 ounces, 10 1-fourth, and 8, and the greatest number of stones in any one person was thirty-three. One of the three that died out of the hundred and five, was very ill with a whooping cough ; another bled to death by an artery into the bladder, it being very hot weather at that time : But this accident taught me afterwards, whenever a vessel bled that I could not find, to dilate the wound with a knife, till I could see it. Now if Jacques or others, who of late have been said to have performed this operation, whether by design or chance, did not take care to secure the blood-vessels, which as yet has not been supposed, whatever their dexterity in operating might be, their success at least can be no secret, for many of their children and most of their men patients must have bled to death. If I have any reputation in this way, I have earned it dearly, for no one ever endured more anxiety and sickness before an operation, yet from the time I began to operate, all uneasiness ceased ; and if I have had better success than some others, I do not impute it to more knowledge, but to the happiness of a mind that was never ruffled or disconcerted, and a hand that never trembled during any operation.

M. LE DRAN'S
METHOD OF OPERATING
FOR THE STONE.

Extracted from the fifth Edition of his

OPERATIONS IN SURGERY.

PRINTED AT LONDON IN 1781.

Mr. Cheselden begins the notes which he has added to Mr. Gataker's translation of M. Le Dran's Operations of Surgery, with a character of that work, which the Editor cannot deny himself the pleasure of placing before the reader. It exhibits a degree of candour and liberality in judging of the merits of one who might, perhaps, in some respects, have been considered as a rival, of which we have but few examples in our times. "There are very few passages," says Mr. Cheselden; "in the foregoing sheets, in which I have ventured to differ from M. Le Dran; wherever I have, it has not been without suspecting my own judgment; and I confess I have never read any book of surgery, from which I have learnt so much as from his. The judicious reader will discover in it the greatest experience joined with the clearest judgment; and the young student will find an exactness, and a descending to the minutest particulars, which to him will be extremely useful, not to say necessary." EDITOR.

M. LE DRAN'S

METHOD OF OPERATING

FOR THE STONE.

THE art of surgery, ever employed in finding out the safest and easiest means of cure, has been frequently engaged in endeavours to improve this operation; and the situation of the bladder, which may be opened either at its fundus or its neck, has suggested different methods of performing it; such as the Apparatus Minor, the Apparatus Major, the Lateral Operation of Mr. Cheselden, and that of M. Rau. There may likewise have been some others, which, as I do not propose to compare one manner of cutting with another, would be needless to mention.

These four methods, which I have described in the Parallel published by me in 1730, have still varied in the hands of those who have practised them; every one having either added to, or retrenched from them, according as his judgment

directed him, in order to render them more perfect. I shall say no more here of these different operations, the advantages and inconveniences of which I have already demonstrated; but shall only describe the manner in which I have performed the operation for some years past, and which I have fixed upon preferably to any other, as it has always proved successful, even in the extraction of the largest stones. From this repeated success we may at least infer, that it is as little liable to inconveniences as any other method.

Every thing being ready for the operation, the patient must be put into a convenient situation for the surgeon, and be fastened there, that he cannot move. In order to this, he is to be placed upon the table, prepared as before directed, with his buttocks even with the edge of the table, his back leaning against the back of the chair, and his head supported by pillows.

Two assistants raise up his knees, and fasten his hands and feet with ligatures. The ligatures which I use are very convenient, as they are soon put on, and as readily taken off again without hurrying the patient, who, indeed, from the fear he is under, is not always sensible of their being applied; and they likewise secure the patient as effectually as the large ligatures used at the hospitals, which are described in the Treatises of Lithotomy. Each of the two ligatures is a tape, made of strong thread, two inches broad, and about two feet long, the two ends of which are joined together by a seam, in such a manner as to describe a circle. The tape

being thus doubled, the ligature is but a foot long. A slip knot, made of such another tape, brings together and joins the two sides of this ligature, which then forms a sort of figure of eight. This knot is not fixed, but may be moved towards either end of the ligature. Each of the assistants passes one of the patient's hands into one end of the ligature, and fastens it with the slip knot at the bending of the wrists; which done, he passes the other end of the ligature under the foot like a stirrup. He then puts one of his hands between the patient's arm and his ham to bear it up, while with the other he holds his foot.

The ligatures being thus applied, I introduce the staff into the bladder in the same manner as was before directed, and feel for the stone. The two assistants before-mentioned keep open the patient's knees, whilst a third stands on one side of him upon a chair. I then raise up the scrotum, and directing the last assistant to support it with both hands, so as to avoid bruising it by pressing it either against the staff or the os pubis, I place his two fore-fingers on each side of the part where the incision is to be made; one of the fingers being laid exactly along that branch of the ischium which rises towards the pubis, and the other pressed upon the raphe, that the skin may be kept fixed and tight. Whilst I thus place the fingers of the assistant who supports the scrotum, I still keep hold of the handle of the staff, and direct it so as to form a right angle with the patient's body; at the same time taking care that the end of it is in the bladder.

This position is the more essential, as all the other instruments are to be conducted along the groove of this. If the handle of the staff was kept inclining towards the belly, the end of it would come out of the bladder; and the gorget missing its guide, would slip between that and the rectum.

The staff being rightly placed, I take the knife from the assistant who holds the instruments, and put it into my mouth; then pressing the beak of the staff against the rectum, I feel the curvature of it through the perinaeum. The incision ought to terminate an inch and a half below where we feel the bottom of the curvature. If we do not carry this incision sufficiently low, it may happen not to be of a size to allow the extraction of a large stone, and might lay us under a necessity of extending it further afterwards, for the skin will not lacerate here, nor easily give way for the passage of the stone. I therefore begin the incision from the lower part of the os pubis, continuing it down to the place that I before directed for its termination; after which, I pass the point of the knife into the groove of the staff, and cutting from below upwards, without taking the point out of the groove, I open the anterior part of the urethra as far as the incision that is in the skin.

The beak of the staff, which was pressed upon the rectum, must now be raised and pressed against the os pubis. At the same time I turn the handle towards the right groin, that the groove which is at the beak of the staff may face the space between the anus and the tuberculum ischii on the left side;

then carrying the point of the knife down the groove, I slide it along the beak, turning the edge that it may face the space between the anus and the tuberculum. By this incision I exactly divide the bulb of the urethra, and by doing this on its side, we are sure to avoid wounding the intestinum rectum, which for want of this precaution has been often cut. This first incision being made, I again pass the point of the knife into the curvature of the staff to the part where it bears against the perinaeum, and direct it to be held there by the assistant who supports the scrotum ; this done, I take a large director, the end of which is made with a beak like that of the gorget (PLATE, Fig. 8.); and conveying this beak upon the blade of the knife into the groove of the staff, I draw the knife out. I then slide the beak of this director along the groove of the staff into the bladder, and I withdraw the staff by turning the handle towards the patient's belly. The following circumstances will sufficiently satisfy us that the director is introduced into the bladder ; first, if it strikes against the end of the staff which is closed ; secondly, if the urine runs along the groove. I next feel for the stone with this director, and having found it, endeavour to distinguish its size and surface, in order to make choice of a proper pair of forceps ; that is, one of a stronger or weaker make, or of a large or small size, agreeable to that of the stone ; after which I turn the groove towards the space between the anus and the tuberculum ischii, and resting it there, convey a bistoury along the groove, shaped as in Fig. 7. the blade of

which is half an inch broad, and about three quarters of an inch long. I continue the incision made by the knife in the urethra, and intirely divide the prostate gland laterally, as also the orifice of the bladder; and I am very certain that the introducing the use of these two instruments, which are not employed by other lithotomists, docs not prolong the operation a quarter of a minute, but rather shortens the time, both by facilitating the dilatation that is afterwards to be made with the finger, and by rendering the extraction of the stone more easy. The bistory being withdrawn, the groove of the director serves to guide the gorget into the bladder; I then introduce my fore-finger along the gorget (which is now easily done, as the urethra and prostatae, being divided, do not oppose its entrance), and with it I dilate the passage for the stone, in proportion to the size of which I discover it to be. This dilatation being made, I withdraw my finger, and use the proper forceps.

I have taken no notice of this beaked director in my "Parallel of the different Methods of cutting for the Stone," having invented this instrument since that treatise was printed; but I find great advantages in the use of it. First, it slips very easily to the end of the staff, which the gorget will not always do without difficulty, in those patients whose prostatae are very large, so that we are more certain of conveying this into the bladder. Secondly, it is not so large as the gorget, and consequently has a freer motion in the neck of the bladder, by which we are better enabled to discover the situa-

tion, size, and surface of the stone. Another advantage is, that it serves to conduct the instrument safely wherewith we divide the urethra and the prostate gland, which cannot be performed by the common knife, because the size of it will not admit of its being carried far enough into the bladder.

Neither have I mentioned this incision in my *Parallel*, as I did not at that time practise it: but I have there observed, that whatever incision is made, in what is called the *Apparatus Major*, a part of the urethra and the *prostatae* remain intire; that these must necessarily be lacerated by the introduction of the finger; and that the finger should be introduced very cautiously, as well to prevent injuring the wounded parts, as to avoid, as much as possible, giving pain. But as it is necessary that the whole passage should be opened, from the end of the first incision to the orifice of the bladder inclusively, it is much better done by incision than laceration; besides, a stone of a middle size cannot be brought away without lacerating the inner surface of the prostate gland on one side, if not on both, and occasioning a considerable contusion, as may be seen in the cases related in the *Parallel* before-mentioned. It is better therefore to divide it by a proper incision, as this will certainly be attended with less pain than lacerating it. Add to this, if on account of extracting a very large stone the parts must necessarily suffer a laceration, that which follows the incision I have proposed, only renders the opening of the wound larger, and occasions much less contusion of the

prostatae. The incision, in this case, directs the laceration, which otherwise is always made with great contusion and irregularity.

Another advantage we derive from the incision, and which cannot be known but by performing the operation, and comparing it with other methods, is the ease with which the finger is introduced, and the passage dilated. Before I used this incision in the urethra, and the prostatae, I often found great difficulty in repressing with the finger, the resistance of the neck of the bladder, which is invested by the prostatae; and when they were large and hard, as they sometimes are, I did not, perhaps, get the better of it without injuring the tendons of the bladder, and the membranous part of the urethra, which alone sustained all the efforts of the finger in preventing the neck of the bladder's being forced towards its fundus; but by making the incision in the urethra and the prostate gland, the difficulty of introducing the finger into the bladder is removed.

PROPOSAL

FOR A

NEW MANNER OF CUTTING

FOR THE STONE,

BY THE EDITOR.

PROPOSAL

FOR A

NEW MANNER OF CUTTING

FOR

THE STONE.

THE form of the cutting gorget of Sir Cæsar Hawkins has, since this instrument first came into use, undergone a very great variety of changes. These changes have usually been ushered into the notice of the Public, with recommendations which would lead us to conceive, that they are calculated to effect, in the form of the instrument, the utmost degree of improvement of which it is susceptible; and that a surgeon about to perform the operation for the stone may rest satisfied with the gorget which has been last recommended, and direct some little share of his attention to the anatomy of the parts to be divided in the operation, and to the best means of obviating the various difficulties which but too frequently occur in its performance. In this persuasion, however, we are seldom permitted

to remain long. Faults are soon detected in the latest improvement, and to remedy these a new form of the instrument is required. To such a height has the desire of improving it arrived, that scarcely any surgeon of the present day will condescend to use a gorget of which he has not been in some measure himself the inventor ; and as a necessary result of this desire, so freely indulged, we have now many more cutting gorgets than we have operators for the stone. These variations in the form of the gorget, so quickly succeeding each other, would seem to shew either that they are not very difficult to make, nor indeed of much importance in themselves, or that the instrument, notwithstanding all the attempts which have been made to improve it, still labours under some radical, if not incurable defects. To say nothing of the injurious consequences which may occasionally have resulted from errors in the form, or in the use of this instrument, and which, whether they have been publicly recorded or not, have at least been tacitly acknowledged, in each new attempt at improving the gorget, it will be generally admitted,

First, That every form of Sir Cæsar Hawkins' cutting gorget requires a very considerable degree of force to introduce it into the bladder, either in the living or dead subject ; a degree of force much greater than is required to introduce a common scalpel in the same direction, and a force which not unfrequently excites alarm in the mind of the operator while exerting it ;

Secondly, That as the rectum in some patients is so much dilated, as not only to come in contact with the inferior surface of the prostate gland, but even to pass up on each side of it, the gorget, however properly conducted, may wound that intestine, and thus give rise either to a dangerous inflammation, or to a tedious and troublesome stercoral fistula in perinaeo ;

Thirdly, That the point or beak of the gorget is liable, in being pushed along the staff into the bladder, to slip out of the groove of the staff, and to pass, in some instances before, and in others behind, the bladder, accidents which are generally fatal in their consequences ; and,

Fourthly, That in operating with the gorget, the surgeon can never be certain that the wound which it makes in the prostate gland and neck of the bladder, will be sufficiently large for the easy introduction of the forceps, and subsequent extraction of the stone.

The knife or scalpel of Mr. Cheselden, when skilfully managed, is not liable to the first, third, and fourth objections which have been stated to the use of the cutting gorget ; and the second objection might perhaps be obviated by employing that knife in the following manner :

After having made the external incisions, and divided the membranous part of the urethra in the way that is usually done for the introduction of the beak of the gorget, a straight grooved staff, similar to that represented in the Plate, Fig. 6. is to be

introduced into the groove of the curved staff, and pushed along it into the bladder. The curved staff is then to be withdrawn, and the surgeon laying hold of the handle of the straight staff with his left hand, and turning the groove upwards and a little outwards, presses the back of it downwards towards the right tuber ischii, and holds it steadily in that position. The point of a straight-backed scalpel being now introduced into the groove of the staff, with its cutting edge inclined upwards and a little outwards, is to be pushed gently forwards into the bladder. The size of the scalpel need only be such as will make a wound in the prostate gland and neck of the bladder sufficiently large to admit the forefinger of the left hand. The scalpel being removed, this finger is to be introduced into the bladder through the wound which has been made, and the staff may then be withdrawn. With the finger the surgeon endeavours to ascertain the size and situation of the stone. If after this examination he judges the incision in the neck of the bladder to be too small for the easy extraction of the stone, he next introduces into the bladder a straight probe-pointed bistoury, with its side close to the fore part of his finger, and its cutting edge upwards. By turning this edge towards the left side, and by keeping the point of his finger always beyond the point of the bistoury, he may safely divide, in the direction of the first incision, as much of the prostate gland and neck of the bladder as he shall deem necessary.

In cases where the surgeon, from a previous examination, has no reason to believe that the rectum, by its dilatation, is in danger of being wounded, the groove of the staff, and of course the edge of the scalpel may be turned in making the internal incision towards the left side; but if it be suspected that the stone is of a very large size, and that a proportionably large opening will be required, the back of the staff may be made to rest, as in the introduction of Mr. Peile's gorget, upon the arch of the pubis, before the scalpel is introduced and carried forwards into the bladder, with its edge inclining outwards and downwards. In both of these cases, however, the enlargement of the internal incision will be more easily and safely effected by the probe-pointed bistoury, in the manner described, than by the use of any cutting instrument, the action of which is not regulated by a finger previously introduced into the bladder.

This manner of operating differs, it is obvious, from that now generally practised in this country; in the instruments which are used in making the internal incision; in the direction, in some cases, of the incision itself; in the constant introduction of the finger into the bladder, previous to that of the forceps, to ascertain the size of the internal incision, and, if possible, also the size and situation of the stone; and in employing the finger as a conductor for the knife, in all cases in which it may be necessary to enlarge the internal incision.

In venturing to offer this proposal to the Public, the Editor is inclined to hope, that, though he may have added one more fruitless attempt to those which have already been made to improve on the operation of Lithotomy, he will not be found to have added to that *lumber* of surgical instruments which are daily obtruding themselves on our notice; inventions which, in general, if they have any object or meaning, seem chiefly intended to supply the want of anatomical knowledge, and practical skill, on the part of those who are expected to employ them.

FINIS.

EXPLANATION
OF
THE PLATE.

MR. CHESELDEN'S INSTRUMENTS.

FIG. I.

PRESENTS the Catheter incurvus, sulcatus, or
hooked Staff with a Groove.

The Manubrium, or Handle.

The Shank.

The bent or crooked Part.

The Rostrum or Beak, which is straight.

FIG. II.

represents the Incision Knife, whose point is
in the middle of the blade.

FIG. III.

Gives a view of the whole hollow part of the Gorgeret.

- a.* The Manubrium, or handle turned to one side, for the easier introduction of the Forceps.
- b.* The hollow concave part.
- c.* The edge of the Button at the narrow end.

FIG. IV.

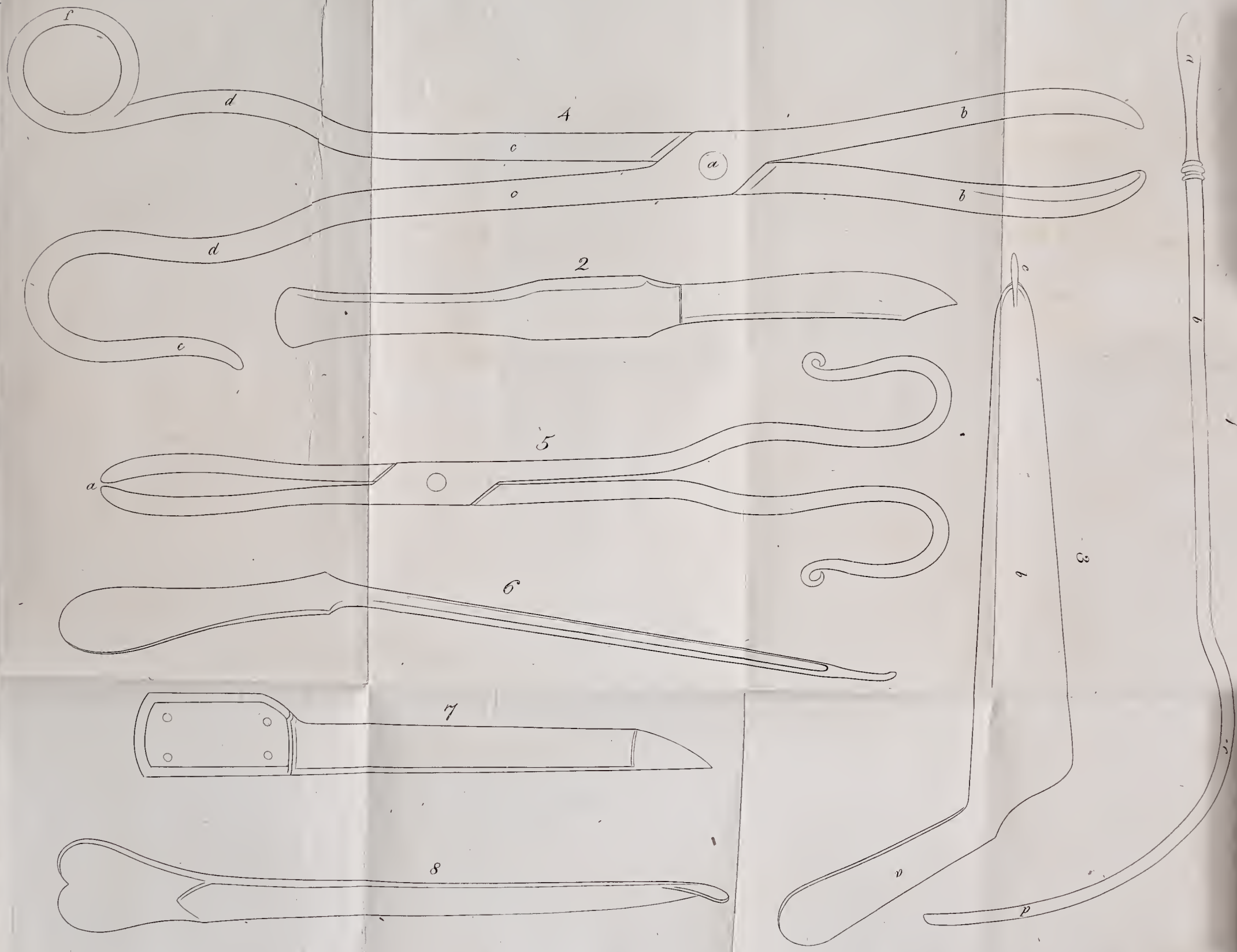
Represents the great pair of extracting Forceps:

- a.* The Screw Rivet in the Joint.
- b.* The Blades.
- c.* The straight part of the Handle or Shank.
- d.* The crooked part of the same.
- e.* The open Bow in which the Shank ends.
- f.* The close Bow.

FIG. V.

This gives a view of the small Pair of Forceps which he commonly makes use of in most of his operations.

- a.* The Blades do not shut close at the ends, because they are contrived to press upon the Joint which hinders them.



M. LE DRAN'S INSTRUMENTS.

FIG. VIII.

Straight Director.

FIG. VII.

Bistoury.



FIG. VI.

Straight Staff, proposed by the Editor.

The anterior extremity of the groove in the curved staff, may be made to terminate in a stop similar to that represented in the figure of the straight staff.



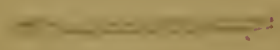
THE HISTORY OF THE

REIGN OF

CHARLES THE FIRST

BY

JOHN BURNET



1679

LONDON: Printed by J. Streater, at the Sign of the Gun, in St. Dunstons Church-yard, 1679.

The Author's Acknowledgments to the Reader. The Author's Acknowledgments to the Reader. The Author's Acknowledgments to the Reader. The Author's Acknowledgments to the Reader. The Author's Acknowledgments to the Reader.

Printed by J. Streater, at the Sign of the Gun, in St. Dunstons Church-yard, 1679.